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ABSTRACT

The United States Training and Employment Service General Aptitude Test Battery (GATB), first published in 1947, has been included in a continuing program of research to validate the tests against success in many different occupations. The GATB consists of 12 tests which measure nine aptitudes: General Learning Ability; Verbal Aptitude; Numerical Aptitude; Spatial Aptitude; Form Perception; Clerical Perception; Motor Coordination; Finger Dexterity; and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, and a standard deviation of 20. Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, when combined, predict job performance. Cutting scores are set only for those aptitudes which aid in predicting the performance of the job duties of the experimental sample. The GATB norms described are appropriate only for jobs with content similar to that shown in the job description presented in this report. A description of the validation sample is included. (AG)

ED 060068

TECHNICAL REPORT

ON

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

CHECKER (Clerical) II	209.688	MAIL CLERK (Clerical)	231.588
IBM CODER	219.388		
INSERTER (Clerical)	230.887		
LETTER OPENER OPERATOR	231.588	SORTER (Clerical)	209.688

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(Supersedes XB-598)

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STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY
FOR

CHECKER (Clerical) II	209.688	MAIL CLERK (Clerical)	231.588
IBM CODER	219.388		
INSERTER (Clerical)	230.887		
LETTER OPENER OPERATOR	231.588	SORTER (Clerical)	209.688

Summary

The entire GATB with the exception of Part B was administered to 66 workers 6 men and 60 women, employed by the Swiss Colony of Monroe, Wisconsin as Checkers, IBM Coders, Inserters, Letter Opener Operators, Mail Clerks, Mail-Order Clerks, Mail Sorters, or Sorters. Ten employees worked interchangeably as Checkers, Mail-Order Clerks, and IBM Coders; 30 worked interchangeably as Inserters, Sorters, Mail Sorters, Mail Clerks, and Letter Opener Operators; 26 worked interchangeably in all eight occupations. The GATB was administered to this group to develop test norms for these occupations. The criteria consist of supervisory ratings of all the workers. A qualitative and statistical analysis of the data resulted in the recommendation that OAP #19 be used as test norms for these occupations.

Norms for Checker II 209.688 and the other Clerical Occupations.

Table I shows the minimum acceptable score for each aptitude included in the test norms for B-257.

TABLE I

Minimum Acceptable Scores for S-31

Aptitude	Tests	Minimum Acceptable Aptitude Scores
Q	CB-1-B	100
T	CB-1-G CB-1-K	100

I. Problem

This study was conducted to determine the best combination of aptitudes and minimum scores to be used as norms on the General Aptitude Test Battery for the occupations of Checker (Clerical) II 209.688, IBM Coder 219.388, Inserter (Clerical) 230.887, Letter Opener Operator 231.588, Mail Clerk (Clerical) 231.588, Mail-Order Clerk I-13.01, and Sorter (Clerical) 209.688.

II. Sample

The final experimental sample consisted of 66 workers, each employed on two or more of the jobs of Checker (Clerical) II, IBM Coder, Inserter (Clerical), Letter Opener Operator, Mail Clerk (Clerical), Mail-Order Clerk, Mail Sorter (Clerical), and Sorter (Clerical).. Originally, there was a total of 99 workers in the experimental sample, but 33 were eliminated, 11 because personal feelings affected the criterion ratings and 22 because of age. Of the final total of 66 workers, 10 were employed in two or more of the three jobs of Checker (Clerical) II, IBM Coder, and Mail-Order Clerk; 30 were employed in two or more of the five jobs of Inserter (Clerical), Letter Opener Operator, Mail Clerk (Clerical), Mail Sorter (Clerical), and Sorter (Clerical); and 26 were employed in two or more of all eight jobs. Because of the similarity of job duties and aptitudinal requirements, and interchangeability of the workers, the group of 66 workers was considered as one occupational sample.

One week is considered to be the training time for any one job. The workers in this sample were selected on the basis of a personal interview. A high school education was desirable but not necessary.

Table II shows the means, standard deviations, ranges, product-moment correlations with the criterion corrected for broad categories, and the standard errors of correlation for age and education for the total sample.

TABLE II

Means (M), Standard Deviations (σ), Ranges,
Product-Moment Correlations with the Criterion
Corrected for Broad Categories ($_{c}r$), and
Standard Errors of Correlation (σ_{cr})
for Age and Education

Checker (Clerical) II	209.688	Mail Clerk (Clerical)	231.588
IBM Coder	219.388		
Inserter (Clerical)	230.887		
Letter Opener Operator	231.588	Sorter (Clerical)	209.688

N=66

	M	σ	Range	$_{c}r$	σ_{cr}
Age (years)	32.9	9.5	17-52	.314	.111
Education (years)	12.1	1.2	8-16	.033	.123

The correlation of .314 between age and the criterion with a standard error of .111 indicates that there is a slight but reliable tendency for older workers to be rated higher. No relationship exists between education and the criterion. No data were available on experience. It was known, however, that most of the younger workers had worked only one season and that the older workers had worked more than one season. Therefore, it can be assumed that the more experienced workers were rated slightly higher than the less experienced workers. Lack of experience data and the type of criterion data precluded statistical correction to eliminate the influence of experience.

III. Job Analysis

Note: The workers in this sample were shifted from one job to another with all workers employed on two or more jobs. The job of Letter Opener Operator is an additional duty of the Mail Clerk.

Job Title: Checker (Clerical) II 209.688

Job Summary

Checks data on giftee and buyers' IBM cards against same data on original order, makes corrections and performs miscellaneous duties such as sorting and filing.

Work Performed

May perform any or all of the following duties:

1. Checks giftee IBM cards - checks items such as order number, name and address of giftee, pack number, and sorting code for agreement with same data on original order; makes necessary corrections in red pencil and returns to key punch operator for revision.

2. Checks buyers' IBM cards - checks items such as order number, name and address of buyer, money code, cash value, type of remittance, and sorting code for agreement with same data on original order; makes necessary corrections and returns to key punch operator for revision.

3. Pulls product cards - pulls product IBM cards from file according to assortment pack numbers on giftee cards, places product cards behind giftee cards and sends cards to IBM operators who make IBM shipping cards and labels.

4. Order breakdown - checks pairing of shipping labels and IBM shipping cards; transfers multiple assortment pack numbers and other special instructions from shipping label or original order to IBM shipping card with red pencil; attaches typed gift cards to shipping data with clip where required; files checked and assembled shipping data by future deliver date; removes shipping data from files on appropriate dates, sorts by assortment pack number and forwards to shipping department.

Job Title: IBM Coder 219.388

Job Summary:

Codes routine orders for cheese received from mail readers or mail sorters to indicate items to be IBM key punched for further processing into IBM shipping order cards, giftee cards, buyers' cards, labels, invoices, credit memos, and order register.

Work Performed

1. Hand stamps coding format on order for each giftee listed.

2. Enters sequence number and cheese assortment number (pack number) to be shipped and indicates future shipping date for each giftee from reference to special chart of shipping times to the 48 states.

3. Indicates with red pencil when IBM is to punch duplicate cards to cross file a firm and an individual.

4. Enters amount and method of remittance which was included with order, using numerical code to signify check, money order, etc.

5. Recaps amount of total order by pack number and records on order.

6. Recaps number of packs to be sent and number of separate addresses involved, and records at bottom of order.

7. Indicates in red pencil whether dictated letter or form letter of acknowledgement is necessary.

8. Initials order to identify person who coded it.

Job Title: Inserter (Clerical) 230.887

Job Summary

Stuffs advertising literature into addressed envelopes and piles on table in orderly fashion. Assembles one copy each of form letters, advertising brochure, and combination order blank and returns envelope in prearranged sequence, and stuffs into addressed envelopes. Works from three piles of material supplied by stock clerk. Must be sure all three pieces of literature are included and also that no duplication occurs.

Job Title: Mail Clerk (Clerical) 231.588
Letter Opener Operator 231.588

Job Summary

Opens daily mail by hand or machine, removes contents and arranges mail for further processing. Sorts mail into various sized categories and separates certain specified types of mail which are not to be opened. Adjusts and operates electric letter opening machine to open standard sized mail. Opens

odd sized mail by hand. Removes contents and clips various pieces of contents together placing remittances such as checks and money orders on top. Checks addresses on envelopes for clues to advertising code and places code in upper right hand corner of correspondence. Stamps date received on all mail. Carries stacks of mail to sorter's table. Folds, stuffs, and stamps outgoing mail.

Job Title: Mail-Order Clerk

Job Summary

Reads sorted orders in one of several processing categories to determine further action necessary, makes provisions and notations concerning handling of orders, and passes on to IBM Coders or proper department for further processing.

Work Performed

May work on any of the following classes of orders:

1. Orders from firms - checks firm's credit rating in Dun and Bradstreet where no remittance was received; determines advertising code by checking buyer's letter of inquiry or looking up previous sample order; makes provisions for following all instructions regarding handling of order and acknowledgements by making appropriate notations or attaching proper colored cards to orders; makes provision for recording shipping information on large orders; indicates whether form or dictated letter of acknowledgement is to be sent.

2. Orders for Cheese-of-the-Season - same treatment as #1 except makes no provision for recording shipping information.

3. Orders from Individuals - makes provision for following all instructions regarding handling of orders and in addition performs the following:

   a. Swiss Colony Order Blanks Without Remittance - indicates whether to go ahead and fill order or write for confirmation of order.

   b. General Correspondence With Remittance - indicates whether form or dictated letter of acknowledgement should be sent.

   c. General Correspondence Without Remittance - indicates whether to go ahead and fill order or refer decision to higher-ups.

Selects out orders from renowned people for special handling. Checks price of items ordered against pack number for agreement.

Job Title: Mail Sorter (Clerical)

Job Summary

Sorts previously opened mail into several office processing categories and distributes to proper department.

Work Performed

1. Sorts mail into the following categories:
   a. Orders from firms
   b. Orders for cheese-of-the-season
   c. Orders from old customers
   d. Wholesale orders
   e. Orders from individuals
      (1) On Swiss Colony Order blanks with remittance
      (2) On Swiss Colony Order blanks without remittance
      (3) On general correspondence with remittance
      (4) On general correspondence without remittance
   f. Orders for Fishbait
   g. General Correspondence
      (1) Inquiries such as prices of cheese
      (2) Invoice payments
      (3) Accounts payable
      (4) Complaints
      (5) Miscellaneous

2. Carries stacks of sorted mail to appropriate mail reader, IBM coder, adjustment bureau or other department.

Job Title: Sorter (Clerical) 209.688

Job Summary

Sorts sealed and addressed pieces of mail by city and piles on table in orderly fashion for tying in tying machine. Sorts pieces of mail from any one state into four alphabetical groups by first letter of city and simultaneously throws pieces for very large cities into separate piles. Re-sorts each alphabetical group by city, cross-piles sorted groups of pieces for each city having 8 or more pieces. Throws remaining mailing pieces for scattered locations into miscellaneous pile.

IV. Experimental Battery

All the tests of the GATB, with the exception of Part E, were administered to the sample group.

V. Criterion

The criteria used in this study are supervisory ratings. The ratings ranged from A+ to F, the median being B. The workers were rated and subsequently divided into three groups, according to their ratings. Those receiving ratings of A- or higher were placed in Group A; those receiving ratings of C+ to B+ inclusive were placed in Group B; and those receiving ratings of C or lower were placed in Group C. The workers were rated by their supervisor in two occupational groups. One group of 36 workers included ratings of the 10 people employed interchangeably as Checker (Clerical) II, IBM Coder, and Mail-Order Clerk plus the 26 who were employed interchangeably on all eight

jobs. The second group included the 30 employed interchangeably as Inserter (Clerical), Letter Opener Operator, Mail Clerk (Clerical), Mail Sorter (Clerical) and Sorter (Clerical) plus the 26 who were employed interchangeably on all eight jobs.

Because of the identity in the method of rating in both groups, and the consistency of the ratings of the 26 people rated in both groups, it was possible to combine the criteria of the two groups. The 40 people who were rated on only one group of jobs retained their original ratings of A, B, or C. The 26 workers who were rated on both groups of jobs received combined ratings of AA, AB, BB, BC, and CC to reflect the rating received for each group of jobs. No worker received a combined rating of AC. Those who obtained a combined rating of AA were included in Group A; those receiving ratings of AB, BB, and BC were included in Group B; and those receiving a combined rating of CC were included in Group C. This resulted in Group A having 18 workers, Group B having 33 workers, and Group C having 15 workers. The criterion was corrected for broad categories which resulted in a score of 62 for Group A, 49 for Group B, and 37 for Group C.

VI. Statistical and Qualitative Analysis

Table III shows the means, standard deviations, standardized means, standardized standard deviations, product-moment correlations with the criterion corrected for broad categories, and standard errors of correlation for each test of the GATB for this sample of clerical occupations.

TABLE III

Means (M), Standard Deviations (σ), Standardized Means (M'), Standardized Standard Deviations (σ'), Product-Moment Correlations with the Criterion Corrected for Broad Categories ($_{cr}$), and Standard Errors of Correlation (σ_{cr}) for each Test of the General Aptitude Test Battery

Checker (Clerical) II 209.688
IBM Coder 219.388
Inserter (Clerical) 230.887
Letter Opener Operator 231.588
Mail Clerk (Clerical) 231.588
Sorter (Clerical) 209.688

N=66

Test	M	σ	M'	σ'	$_{cr}$	σ_{cr}
A Tool Matching	25.0	5.5	113	19	-.053	.123
B Name Comparison	85.3	15.0	114	15	-.014	.123
C H Marking	47.4	6.2	109	17	.169	.120
D Computation	31.5	6.3	113	17	.026	.123
F Two-Dim. Space	25.1	7.1	106	17	.235	.116
G Speed	138.8	17.3	103	17	.210	.118
H Three-Dim. Space	19.9	5.4	107	16	-.002	.123
I Arithmetic Reason.	11.8	3.0	118	17	-.052	.123
J Vocabulary	25.9	6.9	111	15	-.133	.121
K Mark Making	76.0	6.7	110	14	.350	.108
L Form Matching	28.9	7.1	107	18	.173	.119
M Place	91.9	7.9	109	18	.113	.122
N Turn	106.5	8.5	113	20	.249	.115
O Assemble	29.2	3.6	107	16	.217	.117
P Disassemble	30.4	3.9	109	21	.043	.123

Table IV shows the means, standard deviations, product-moment correlations with the criterion corrected for broad categories, and standard errors of correlation for each aptitude of the GATB for this sample.

TABLE IV

Means (M), Standard Deviations (σ), Correlations with the Criterion Corrected for Broad Categories ($_{c}r$), and Standard Errors of Correlation (σ_{cr}) for Each Aptitude of the General Aptitude Test Battery

Checker (Clerical) II	209.688	Mail Clerk (Clerical)	231.588
IBM Coder	219.388		
Inserter (Clerical)	230.887		
Letter Opener Operator	231.588	Sorter (Clerical)	209.688

N=66

Aptitude	M	σ	$_{c}r$	σ_{cr}
G Intelligence	115.4	14.8	-.080	.122
V Verbal Aptitude	110.9	14.8	-.135	.121
N Numerical Aptitude	115.7	16.8	.001	.123
S Spatial Aptitude	107.0	15.9	.036	.123
P Form Perception	112.4	18.5	.020	.123
Q Clerical Perception	114.3	15.0	-.014	.123
A Aiming	110.7	14.9	.262	.115
T Motor Speed	107.3	14.7	.294	.112
F Finger Dexterity	108.3	17.0	.167	.120
M Manual Dexterity	111.4	18.7	.178	.119

The statistical results were interpreted in the light of significant aptitude requirements as indicated by the job analysis data.

On the basis of the job analyses it appears that, of the aptitudes measured by the GATB, aptitudes Q (clerical perception) and T (motor speed) are the important aptitudes for performing duties of the jobs described. Aptitude Q would be involved in checking numbers, names, addresses, and codes, etc., while aptitude T would be involved in handling orders, cards, and mail rapidly.

Although a minimal amount of G is probably required in the jobs, a high amount of this aptitude is not indicated in the job analyses for job performance. Aptitude N (except for one calculation to see if remittance covers cost) does not appear as important as Q for checking numbers and codes, etc.

Table IV indicates that aptitudes A and T correlate significantly with the criterion at the 5% level of confidence. The correlation coefficients for these aptitudes are .262 and .294, respectively.

Aptitudes Q, A, and T warrant further consideration for inclusion in the final norms. Aptitudes Q and T were chosen for inclusion because of their importance to job performance as indicated by the job analyses, and, in addition, aptitude T correlates significantly with the criterion. Although aptitude A correlates significantly with the criterion, it was not included in the final norms because it does not add to the selectivity of Q and T and does not appear to be significant according to the job analysis. OAP #19 (Q=100 and T=100) already covers some of the jobs included in this study and has cutting scores not too far from one standard deviation below the obtained means for aptitudes Q and T. Accordingly, a tetrachoric correlation coefficient was computed to determine the relationship between OAP #19 and the criterion. Criterion groups A and B were considered "high" and Group C was considered "low". No significant relationship was found between OAP #19 and the criterion for the sample of 66 workers.

Since Table II shows that age correlates significantly (.314) with the criterion, it was believed that the influence of age on the criterion might be tending to lower the tetrachoric correlation coefficient between the norms of OAP #19 and the criterion. In order to lessen this influence, it was decided to compute the tetrachoric correlation coefficient between the norms of OAP #19 and the criterion for workers 45 years of age and under. Seven workers (46 to 52 years of age) were eliminated, leaving a sample of 59 workers. Criterion groups A and B were considered "high" and group C considered "low". Table V shows the relationship between OAP #19 and the criterion for the sample of 59 workers 45 years of age and under.

TABLE V

Number of Workers
45 Years of Age and Under
in High and Low Criterion Groups
who Pass and Fail on OAP #19
Q=100 and T=100

Checker (Clerical) II.	209.688	Mail Clerk (Clerical)	221.538
IBM Coder	219.388		
Inserter (Clerical)	230.887		
Letter Opener Operator	231.588	Sorter (Clerical)	209.688

N=59

		Norms		Total
		Fail	Pass	
CRITERION	High	12	33	45
	Low	8	6	14
Total		20	39	59

$r_{tet} = .47$ $\quad X^2 = 3.17$

$\sigma_{r_{tet}} = .23$ $\quad \frac{p}{2} < .05$

Table V shows that OAP #19 eliminates approximately 34% of the sample. 73% of the workers in the high criterion group pass the norms and 57% of the workers in the low criterion group fail. The tetrachoric correlation coefficient of .47 with a standard error of .23 indicates that OAP #19 has good predictive value for this sample of clerical occupations. The Chi Square of 3.17 which yields a $\frac{P}{2}$ value of less than .05 indicates a high degree of probability that the relationship between OAP #19 and the criterion is significant.

VII. Conclusions

On the basis of all considerations discussed above, it is recommended that Aptitudes Q and T each with a minimum score of 100 be used as GATB norms for the occupations of Checker (Clerical) II 209.688 IBM Coder 219.388 Inserter (Clerical) 230.887, Letter Opener Operator 231.588, Mail Clerk (Clerical) 231.588

and Sorter (Clerical) 209.688.